*भारतीय मानक*
*Indian Standard*

**IS 4359 : 2021**

# कत्था — विशिष्टि

*( पहला पुनरीक्षण )*

# *Kattha* — Specification

*( First Revision )*

ICS 67.220.20

© BIS 2021

भारतीय मानक ब्यूरो
BUREAU OF INDIAN STANDARDS
मानक भवन, 9 बहादुरशाह ज़फर मार्ग, नई दिल्ली – 110002
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI-110002
www.bis.gov.in www.standardsbis.in

**August 2021** **Price Group 3**

Food Additives Sectional Committee, FAD 08

## FOREWORD

This Indian Standard (First Revision) was adopted by the Bureau of Indian Standards, after the draft finalized by the Food Additives Sectional Committee had been approved by the Food and Agriculture Division Council.

*Kattha* is obtained mostly by crystallization in cold from the water extractives of the heartwood of *Acacia catechu* Willd. fam. Leguminosae commonly known as *Khair* tree, which is widely distributed in India, from the north-west plains to eastwards in Assam and throughout the country, particularly in the deciduous and drier regions. The other species namely, *A. chundra* Willd and *A. catechuoides* Benth are sometimes used for extraction of *kattha*.

The manufacture of *kattha* is carried out both, as a cottage scale industry in and around the forests abounding in *khair* trees, and also in the organized sector. The general principle of extraction of the heartwood and of consequent separation of *kattha* (containing most of catechin) from cutch (principally catechu-tannic acid) is the same in cottage sector as well as large scale units. In the conventional process of *kattha* manufacture followed by cottage sector of the industry, during separation of the crystalline *kattha*, the soluble cutch-tans, a valuable by-product are neither effectively removed nor recovered, except by a few.

*Kattha* is one of the principal ingredients used in the preparation of *PAN* from betel leaves, for chewing purposes, when in combination with lime, it gives the characteristic red colouration. In Ayurvedic and Unani systems of medicine, *kattha* is used as astringent; cooling and digestive; useful in relaxed conditions of throat, mouth and gums; and also in cough and diarrhoea. Externally, it is employed as an astringent and as a cooling application to ulcers, boils and eruptions of the skin.

The standard was first published in 1967. This revision is undertaken to incorporate the two amendments and to harmonize the chemical requirements of the standard with the *Catechu Grading and Marking, Rules*, 1982. Requirement of 'Water Insoluble Residues' has been added in this revision. In the preparation of this standard assistance has been derived from the *Catechu Grading and Marking, Rules*, 1982. Due consideration has also been given to the provisions of the *Food Safety and Standards Act*, 2006 and the Rules and Regulations framed thereunder and the *Legal Metrology* (*Packaged Commodities*) *Rules*, 2011. However, this standard is subject to the restrictions imposed under these, wherever applicable.

The composition of the Committee responsible for the formulation of this standard is given at Annex B.

For the purpose of deciding whether a particular requirement of this standard is complied with the final value, observed or calculated, expressing the result of a test or analysis shall be rounded off in accordance with IS 2 : 1960 'Rules for rounding off numerical values ( *revised* )'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

# Indian Standard

# *KATTHA* — SPECIFICATION

## ( *First Revision* )

## 1 SCOPE

This standard prescribes the requirements and the methods of sampling and test for *Kattha* obtained from the heartwood extractives of *Acacia catechu* Willd, *A. chundra* and *A. catechuoides* Benth, fam. Leguminosae.

## 2 REFERENCES

The standards given below contain provisions which, through reference in this text, constitute provisions of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of these standards.

| *IS No.* | *Title* |
|---|---|
| 1699 : 1995 | Methods of sampling and test for food colours |
| 2491 : 2013 | Food hygiene — General principles — code of practice |
| 2962 : 1964 | Methods of sampling and test of *Kattha* |

## 3 GRADES

There shall be three grades of the material, namely, Grade 1, Grade 2 and Grade 3 (*see* Table 1).

## 4 REQUIREMENTS

### 4.1 Description

The material shall be obtained by suitably crystallizing out the catechin-rich fraction from the concentrated and cooled extractives of the heartwood of *Acacia catechu* Willd*, A. chundra* Willd, and *A. catechuoides* Benth fam. Leguminosae. It shall be comparatively free from the water-soluble catechu-tannic acid or cutch, leaves, bark and other cellulosic materials, adulterants and other impurities, such as sand and earth or dirt.

**4.1.1** It shall be dried and pressed in the form of cubes, or irregular blocks or thick flakes of light rust-brown to dark-brown in colour, and fluffy in mass.

**4.1.2** It shall be astringent, of a slightly bitter taste and free from unpleasant odours. The material shall also be free from titanium dioxide. When examined under microscope, a freshly-broken surface shall exhibit numerous shining and acicular crystals of catechin.

**4.1.3** The material shall be free from gambier *kattha* when tested by the following method.

Take of 0.3 g of the material and warm with 2 ml of 90 percent ethyl alcohol, cool and filter. Add 2 ml of a solution of an aqueous sodium hydroxide, shake and allow to separate. Absence of a brilliant green fluorescence in the upper layer indicates absence of gambier *kattha*.

**4.2** The material shall also comply with the requirements given in Table 1 when tested in accordance with the methods given in col 6.

**4.2.1** In case the moisture content is less or more than 16 percent (on as received basis), weight of the consignment shall be adjusted on the basis of 16 percent moisture.

### 4.3 Hygienic Conditions

The material shall be manufactured and packed under hygienic conditions in licenced premises (*see* IS 2491). The basic principles of hygiene should be applied with appropriate modifications.

**4.4** The product shall comply with the requirements of pesticide residues, heavy metals, aflatoxins, etc, as prescribed in *Food Safety and Standards Act*, 2006 and the Rules made thereunder.

## 5 PACKING AND MARKING

**5.1** The material shall be suitably packed in only sound, clean and dry container made of jute or wooden boxes or plastic bags or tin containers or paper cartons or any other material as agreed to between the purchaser and the supplier. The container shall be free from any insect infestation or fungus contaminations and also free from any undesirable smell.

**5.2** The containers shall be legibly and indelibly marked with the following:

a) Name of the material and its grade;
b) Name of the manufacturer or his registered trade-mark, if any;
c) Net quantity when packed;

d) Lot/Batch/Code No.;

e) Month and year of manufacture;

f) Best before ..........months from manufacture; and

g) Any other requirements as specified under the *Legal Metrology (Packaged Commodities) Rules,* 2011 and *Food Safety and Standards (Packaging and Labelling) Regulation*, 2011 and the Rules framed thereunder.

### 5.3 BIS Certification Marking

The product(s) conforming to the requirements of this standard may be certified as per the conformity assessment schemes under the provision of *Bureau of Indian Standards Act*, 2016 and Rules and Regulation framed there under and the product(s) may be marked with the Standard Mark.

## 6 SAMPLING

**6.1** The method for drawing representative samples and for preparation of samples for test shall be as given in **2** of IS 2962.

**6.2 Number of Tests** — Tests for catechin content shall be conducted on each of the individual samples. Tests for all the other requirements shall be conducted on the composite sample.

### 6.3 Criteria for Conformity

**6.3.1** *For Individual Sample* — The lot shall be declared to have satisfied the requirements for the catechin content tested on the individual samples if **x – 0.6 R** ≥ the specified value for each declared grade.

where

$$x = \frac{\text{the sum of individual test results}}{\text{number of test results}}$$

and

R = the difference between the maximum and the minimum test results.

**6.3.2** *For Composite Sample* — For declaring the conformity of the lot to the requirements of all other characteristics, the test results on the composite sample shall have to meet the corresponding specified requirements.

**Table 1 Requirements for Kattha**

( *Clauses* 3 *and* 4.2 )

| Sl No. | Characteristic | Requirement | | | Methods of Test, Ref to |
|---|---|---|---|---|---|
| | | Grade 1 | Grade 2 | Grade 3 | |
| (1) | (2) | (3) | (4) | (5) | (6) |
| i) | Loss on drying, percent by mass, *Max* | 12.0 | 12.0 | 12.0 | **6** of IS 2962 |
| ii) | Catechin content, percent by mass, *Min* | 60.0 | 45.0 | 30.0 | **7** of IS 2962 |
| iii) | Matter insoluble in rectified spirit, percent by mass, *Max* | 15.0 | 20.0 | 25.0 | **9** of IS 2962 |
| iv) | Matter insoluble in boiling water, percent by mass, *Max* | 3.0 | 6.0 | 7.5 | **11** of IS 2962 |
| v) | Total ash, percent by mass, *Max* | 1.3 | 2.5 | 3.5 | **12** of IS 2962 |
| vi) | Acid insoluble ash, percent by mass, *Max* | 0.2 | 0.5 | 0.5 | **13** of IS 2962 |
| vii) | Water insoluble residue at 37±2 °C, percent by mass, *Max* | 8.0 | 12.0 | 16.0 | **10** of IS 2962 |
| viii) | Arsenic, mg/kg, *Max* | 1.1 | 1.1 | 1.1 | **15** of IS 1699 |
| ix) | Lead, mg/kg, *Max* | 2.5 | 2.5 | 2.5 | **15** of IS 1699 |
| x) | Copper, mg/kg, *Max* | 30 | 30 | 30 | **15** of IS 1699 |
| xi) | Zinc, mg/kg, *Max* | 50 | 50 | 50 | **15** of IS 1699 |
| xii) | Tin, mg/kg, M*ax* | 250 | 250 | 250 | Annex A |

# ANNEX A

## DETERMINATION OF TIN

[ *Table* 1*, Sl No.* (xii) ]

**A-1 GENERAL**

Any one of the two methods given below may be used for determination of Tin, but in case of dispute the photometric method described in **A-1.1** shall be used.

**A-1.1 Photometric Method**

**A-1.1.1** *Reagents*

**A-1.1.1.1** *Fusion mixture* — Three parts anhydrous sodium carbonate and 1 part potassium cyanide.

**A-1.1.1.2** *Dilute hydrochloric acid* — Mix equal volumes of water and concentrated hydrochloric acid.

**A-1.1.1.3** *Diethyl ammonium diethyl dithiocarbamate solution* — 1 : 20 in chloroform.

**A-1.1.1.4** *Chloroform*

**A-1.1.1.5** *'Dithiol' reagent* — Dissolve 0.1 g of dithiol in 2.5 ml of 5 N sodium hydroxide solution. Add 0.5 ml of thioglycollic acid and dilute to 50 ml with water.

**A-1.1.1.6** *'Lorol' solution* — 1 percent aqueous solution of sodium lauryl sulphate.

**A-1.1.1.7** *Standard tin solution* — Dissolve 1g of pure tin metal in 100 ml of 1 : 1 hydrochloric acid and dilute with the same concentration of acid to 1 litre. 1 ml contains 1 mg of tin (as Sn). Prepare more dilute solutions when required.

**A-1.1.2** *Preparation of Solution* — Weigh accurately 5 to 10 g of sample (*see* **2.3.3** of IS 2962) depending upon tin content into a small porcelain crucible. Dry and char the sample on a hot-plate, heat to ash in a muffle furnace at 600 °C. Add 1 g of fusion mixture and fuse with the ash by holding the crucible with nickel tongs over a Bunsen burner. Cool the crucible. Place it in a small beaker and cover the latter with a watch glass. Add 10 ml of water and run 10 ml of dilute hydrochloric acid (1 : 1) cautiously into the crucible (fume cupboard). Boil the contents of the beaker gently for 30 min. Cool and filter. Wash the beaker and crucible with water.

**A-1.1.3** *Separation of Copper*

Transfer the solution to a small separating funnel and add 5 ml of diethyl ammonium diethyl dithiocarbamate reagent. Shake and run off the chloroform layer, extract the aqueous layer with successive 1 ml portions of the reagent until the chloroform layer is finally colourless. Wash the aqueous layer with a few millilitres of chloroform. Dilute the aqueous solution with water to 50 ml in a volumeteric flask.

**A-1.1.4** *Procedure*

To 10 ml of the aqueous solution add 0.5 ml of dilute hydrochloric acid (1 : 1) and transfer it to a 20 ml volumetric flask and add in the order given; 1 drop of thioglycollic acid, 2 ml of concentrated hydrochloric acid and 0.5 ml of 'lorol' solution and 1 ml 'dithiol' reagent with thorough mixing after each addition. Place the flask in a water-bath at 60 °C for 10 min. Cool and dilute the contents to the mark. Measure the optical density at 545 mµ against a reagent blank.

**A-1.1.5** Construct a titration curve with the aid of standard tin solution and calculate the tin content.

**A-1.2 Stannous Oxide Method**

**A-1.2.1** *Reagents*

**A-1.2.1.1** *Ammonium hydroxide solution* — sp gr 0.90.

**A-1.2.1.2** *Concentrated hydrochloric acid* — sp gr 1.11.

**A-1.2.1.3** *Dilute sulphuric acid* — 1 : 3 by volume.

**A-1.2.1.4** *Hydrogen sulphide gas* — Passed through a wash bottle containing water.

**A-1.2.1.5** *Wash solution* — Mix 100 ml of saturated ammonium acetate solution with 50 ml of glacial acetic acid and 850 ml of water.

**A-1.2.1.6** *Ammonium polysulphide solution* — Pass hydrogen sulphide gas through 200 ml of ammonium hydroxide solution contained in a bottle immersed in ice-cold water until no more gas is absorbed. Add 200 ml of the ammonium hydroxide solution and dilute with water to make 1 000 ml. Add 25 g of flowers of sulphur to this solution and keep for several hours to digest the sulphur and then filter. Use the filtrate.

**A-1.2.1.7** *Dilute acetic acid* — Dilute 1 volume of glacial acetic acid with 9 volumes of water.

**A-1.2.2** *Procedure*

**A-1.2.2.1** Take a suitable aliquot of the test solution (**A-2.1**), dilute to 400 ml, cool and add ammonium hydroxide solution until the contents are alkaline. Add 20 ml of either concentrated hydrochloric acid or dilute sulphuric acid. Cover the beaker with a watch glass. Heat the solution to about 95 °C and pass a slow stream of hydrogen sulphide gas through it for 1 h. Digest the mixture at 95 °C for 1 h and allow it to stand for another 30 min. Filter the contents of the beaker through a quantitative filter paper and wash the residue of stannous sulphide on the filter, alternatively with three portions each of wash solution and hot water.

**A–1.2.2.2** Transfer the residue along with the filter paper to a 50 ml beaker, add 10 to 20 ml of the ammonium polysulphide solution, heat to boiling and filter by decantation. Add 10 ml of the ammonium polysulphide solution, boil and filter again. Repeat this once more and finally wash the filter paper with hot water. Acidify the combined filtrate and washings with dilute acetic acid, gently boil for 1 hour and allow to stand overnight.

**A-1.2.2.3** Filter the resulting mixture through an 11 cm ashless filter paper. Wash the filter paper alternately with two portions each of the wash solution and hot water. Transfer the residue alongwith the filter paper to a tarred porcelain crucible and dry it thoroughly in an air-oven. Carefully ignite the filter paper, using a Bunsen flame and incinerate the contents to convert the sulphide to oxide. Partly cover the crucible and heat strongly over a Bunsen or Meker burner. The sulphide shall be gently roasted to the oxide which may then be heated to a high temperature without loss by volatilization.

**A-1.2.2.4** Cool the crucible in a desiccator and weigh as stannous oxide ($SnO_2$). Repeat the process of heating, cooling and weighing till the difference between two successive weighings is less than 1 mg. Note the lowest weight. Obtain the weight of metallic tin from the weight of stannous oxide by using the factor 0.787 7.

# ANNEX B

*( Foreword )*

## COMMITTEE COMPOSITION

Food Additives Sectional Committee, FAD 08

| *Organization* | *Representative(s)* |
|---|---|
| CSIR - Indian Institute of Toxicology Research, Lucknow | Dr Yogeshwar Shukla (***Chairperson***) |
| All India Food Processors Association,New Delhi | Dr K. L. Gaba |
| Association of Food Scientists and Technologists India, Mumbai | Dr Uday S Annapure<br>Dr Vikas Singh Chauhan (*Alternate*) |
| Bose Institute, Kolkata | Prof. Gaourisankar Sa |
| CSIR - Central Food Technological Research Institute, Mysore | Dr Ngaseppam Iboyaima<br>Dr Aruna Kumar (*Alternate*) |
| Confederation of Indian Food Trade and Industry, New Delhi | Dr Jasvir Singh<br>Shri Manoj Mehta (*Alternate*) |
| Confederation of Indian Industry, New Delhi | Ms Neha Agarwal<br>Ms Mamta Arora Budhiraja (*Alternate*) |
| Consumer Education and Research Centre, Ahmedabad | Ms Anindita Mehta<br>Ms Dolly A. Jani (*Alternate*) |
| Consumer Guidance Society of India, Mumbai | Dr Sitaram Dixit<br>Dr M. S. Kamath (*Alternate*) |
| Defence Food Research Laboratory, Mysore | Dr G. K. Sharma<br>Dr D.d. Wadikar (*Alternate*) |
| Department of Chemical Technology, University of Calcutta, Kolkatta | Prof. Arup Mukherjeee<br>Dr Farooque Abdullah (*Alternate*) |
| Envirocare Laboratories Private Limited, Thane | Dr Priti Amritkar<br>Dr Nilesh Amritkar (*Alternate*) |
| Food Ingredients Manufacturers and Suppliers of India Association, Thane | Mr Firoz H. Naqvi<br>Shri Prakash Sanghvi (*Alternate*) |
| Food Safety and Standards Authority of India, New Delhi | Advisor (Standards) |
| Grasim industries limited, Nagda | Shri Pankaj Gupta |
| ICMR - National Institute of Nutrition, Hyderabad | Dr J. Padmaja |
| Indian Institute of Chemical Technology, Hyderabad | Dr Ashok Kumar Tiwari<br>Dr T. Kumaraguru (*Alternate*) |
| Indian Pharmacopoeia Commission, Ghaziabad | Ms Shruti Rastogi<br>Mr Jai Shiv Chauhan (*Alternate*) |
| Indian Salt Manufacturers Association, Ahmedabad | B.c. Rawal<br>P.r. Dhruve (*Alternate*) |
| Institute of Chemical Technology, Department of Oils, Oleochemicals and Surfactants Technology, Mumbai | Dr Uday S. Annapure<br>Prof Rekha Singhal(*Alternate*) |
| Office of the Salt Commissioner, Jaipur | B. S. Nagar (*Alternate*) |
| Protein Foods and Nutrition Development Association of India, Mumbai | Mr Bhupinder Singh<br>Dr Jagadish Pai (*Alternate*) |

| *Organization* | *Representative(s)* |
|---|---|
| VR Food Tech Private Limited, Mumbai | Dr Ashlesha Parchure<br>Dr N. Ram (*Alternate*) |
| BIS Directorate General | Smt Suneeti Toteja, Scientist 'E' and Head (FAD)<br>[ Representing Director General[ ( *Ex- Officio* ) ] |

*Member Secretary*
Smt Varsha Gupta
Scientist 'D', Bis

**Bureau of Indian Standards**

BIS is a statutory institution established under the *Bureau of Indian Standards Act*, 2016 to promote harmonious development of the activities of standardization, marking and quality certification of goods and attending to connected matters in the country.

**Copyright**

BIS has the copyright of all its publications. No part of these publications may be reproduced in any form without the prior permission in writing of BIS. This does not preclude the free use, in the course of implementing the standard, of necessary details, such as symbols and sizes, type or grade designations. Enquiries relating to copyright be addressed to the Director (Publications), BIS.

**Review of Indian Standards**

Amendments are issued to standards as the need arises on the basis of comments. Standards are also reviewed periodically; a standard along with amendments is reaffirmed when such review indicates that no changes are needed; if the review indicates that changes are needed, it is taken up for revision. Users of Indian Standards should ascertain that they are in possession of the latest amendments or edition by referring to the latest issue of 'BIS Catalogue' and 'Standards: Monthly Additions'.

This Indian Standard has been developed from Doc No.: FAD 08 (2843).

## Amendments Issued Since Publication

| Amend No. | Date of Issue | Text Affected |
|---|---|---|
| | | |
| | | |
| | | |
| | | |

**BUREAU OF INDIAN STANDARDS**

**Headquarters:**

Manak Bhavan, 9 Bahadur Shah Zafar Marg, New Delhi 110002
*Telephones*: 2323 0131, 2323 3375, 2323 9402 *Website*: www.bis.gov.in

**Regional Offices:** *Telephones*

Central : Manak Bhavan, 9 Bahadur Shah Zafar Marg
NEW DELHI 110002 { 2323 7617, 2323 3841

Eastern : 1/14 C.I.T. Scheme VII M, V.I.P. Road, Kankurgachi
KOLKATA 700054 { 2337 8499, 2337 8561, 2337 8626, 2337 9120

Northern : Plot No. 4-A, Sector 27-B, Madhya Marg
CHANDIGARH 160019 { 265 0206, 265 0290

Southern : C.I.T. Campus, IV Cross Road, CHENNAI 600113 { 2254 1216, 2254 1442, 2254 2519, 2254 2315

Western : Manakalaya, E9 MIDC, Marol, Andheri (East)
MUMBAI 400093 { 2832 9295, 2832 7858, 2832 7891, 2832 7892

**Branches** : AHMEDABAD. BENGALURU. BHOPAL. BHUBANESHWAR. COIMBATORE. DEHRADUN. DURGAPUR. FARIDABAD. GHAZIABAD. GUWAHATI. HYDERABAD. JAIPUR. JAMMU. JAMSHEDPUR. KOCHI. LUCKNOW. NAGPUR. PARWANOO. PATNA. PUNE. RAIPUR. RAJKOT. VISAKHAPATNAM.

Published by BIS, New Delhi